COURSE ANNOUNCEMENT – MATH 204B

Course title: "Cyclotomic Fields"

Professor: Cristian D. Popescu

Brief Description: The course will revolve around two major themes: *Special values of Dirichlet L-functions; Special units in abelian extensions of Q.* The theory will be developed with an eye on and as a particular case of the very general Equivariant Tamagawa Number Conjecture of Bloch-Kato. In the process, I will introduce various techniques and theories of central importance in modern number theory, including the theory of Euler Systems (due to Kolyvagin) and rudiments of classical Iwasawa Theory (due to Iwasawa and Greenberg.) This will give me the chance to state and discuss various central open problems in number theory, such as the Vandiver Conjecture, the Iwasawa-Leopoldt Conjecture, Chinburg's Omega3 Conjecture, particular cases of Stark's Conjectures etc.

Background requirements: Basic knowledge of algebraic number theory (at the level of Wee Teck Gan's Fall 2007 course or D. Marcus' "Number Fields") will be assumed. As much as it hurts me to say this, *I will not assume knowledge of class field theory.*

Bibliography: Although I will not follow a specific text, the interested parties are strongly encouraged to read *L. Washington's "Introduction to Cyclotomic Fields" (2nd Edition)* and *S. Lang's "Cyclotomic Fields I and II" (combined 2nd edition).*